PATENT 2224-0193P

IN THE U.S. PATENT AND TRADEMARK OFFICE

atentee:

Hiroshi TAKAHASHI et al.

Patent No.:

6,788,368 B2

Issue Date:

September 7, 2004

For:

TRANSMITTABLE LIGHT-SCATTERING SHEET AND

LIQUID CRYSTAL DISPLAY DEVICE

ATTN: CERTIFICATE OF CORRECTIONS BRANCH

REQUEST FOR CERTIFICATE OF CORRECTION UNDER 37 C.F.R. § 1.322

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

December 3, 2004

Sir:

The Office is respectfully requested to expeditiously consider the attached Certificate of Correction form. This Certificate of Correction form sets forth claims 18-21, which correspond to claims 22-25 in the application.

In the Notice of Allowability, the Examiner stated that the allowed claims are 1-14 and 16-18. In the detailed action at page 2 of the Notice of Allowability, the Examiner states "Claims 19-25 have been cancelled." Upon discussing allowable subject matter, the Examiner states "Claims 1-14 and 16-18 are allowed."

Patentees respectfully note that the application as originally filed on November 23, 2001, presented claims 1-24 for the Examiner's consideration. On February 3, 2003, the Examiner issued an election/restriction requirement that divided the

Certificate
DEC 0 8 2004

of Correction

1 3 DEC 2004

claims into the following two groups:

Claims 19-21 drawn to a method of making a semiconductor device; and

Claims 1-18 and 22-24 drawn to a semiconductor device.

Also, Patentees note that claims 22-24 depend upon claim 1 and these claims became instantly allowable upon the allowance of claim 1.

Claim 25, which was presented on August 8, 2003, also depends upon claim 1 and became instantly allowable upon allowance of claim 1.

In the Reply of March 5, 2003, the Patentees elected group II (Claims 1-18 and 22-24) for examination on the merits. Accordingly, the allowed claims should have been claims 1-14, 16-18 and 22-25. Also, claim 15 had been cancelled and its subject matter had been incorporated into claim 1 in the Reply of August 8, 2003.

Further, on December 3, 2003, the Patentees sent a Letter to the Examiner entitled "Comments on Examiners Reasons for Allowance" requesting that the Examiner indicate the allowability of all the elected claims. However, the Examiner failed to act on this Letter.

Accordingly, U.S. Patent 6,788,368 failed to present claims 22-25, which should have appeared in the patent as claims 18-21. Accordingly, the Patentees respectfully request an expedited issuance of a Certificate of Correction due to the USPTO's mistake.

Since this Certificate of Correction is being filed in order

to correct an error that was clearly made by the U.S. Patent and Trademark Office, the issuance of a Certificate of Correction

under 35 U.S.C. § 254 without charge to the patentee is respectfully requested.

It is believed that no fee is required. However, if there are any fees chargeable, please charge Deposit Account No. 02-2448.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

P.O. Box 747

Falls Church, VA 22040-0747

(703) 205-8000

Attachment:

Certificate of Correction (Form PTO-1050)

Notice of Allowability

Reply to Restriction Requirement dated March 5,

2003

Reply under 37 C.F.R. § 1.111 dated August 8, 2003

Comments on Examiners Reasons for Allowance dated

December 3, 2003

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

6,788,368 B2 PATENT NO. :

September 7, 2004 DATED

Takahashi et al. INVENTOR(S):

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Add the following allowed claims:

- A reflective liquid crystal display unit which comprises a liquid crystal cell having a liquid crystal sealed therein, a reflecting means for reflecting an incident light disposed behind the liquid crystal cell, and the light-scattering sheet recited in Claim 1 disposed forwardly of the reflecting means.
- 19. The reflective liquid crystal display unit according to claim 18, wherein a polarizing plate is disposed forwardly of the liquid crystal cell, and the lightscattering sheet recited in Claim 1 is disposed between the liquid crystal cell and the polarizing plate.
- 20. The reflective liquid crystal display unit according to claim 18, which comprises a liquid crystal cell having a liquid crystal sealed therein, a reflecting means for reflecting an incident light disposed on one side of the liquid crystal cell, a polarizing means for polarizing a reflective light is disposed on the other side of the liquid crystal cell, and the light-scattering sheet recited in Claim 1 disposed between the liquid crystal cell and the polarizing means.
- 21. The transmittal light-scattering sheet according to Claim 1, wherein the plurality of polymers vary in refractive index.

MAILING ADDRESS OF SENDER: 2224-0193P - GMM/REG/jao



No. of Additional copies

BIRCH, STEWART, KOLASCH & BIRCH, LLP PTO BOX 16X

PATENT NO. 6,788,368 B2

Burden Hour Statement: This form is estimated to take 1.0 hour to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLTED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

DEC 0 3 2004 30 JULY SOLUTION OF THE PARTY O

UNITED STATES DEPARTMENT OF COMMERCE United States Patent and Trademark Office Address: COMMISSIONER FOR PATENTS P.O. Box 1450 Alexandria, Virginia 22313-1450 www.uspib.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

09/24/2003

FALLS CHURCH, VA 22040-0747

12/24/03 12/24/03

EXAMINER

STEVENSON, ANDRE C

ART UNIT

CLASS-SUBCLASS

2812

349-115000

DATE MAILED: 09/24/2003

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/979,524	11/23/2001	Hiroshi Takahashi	2224-0193P	6338

TITLE OF INVENTION: TRANSMISSION LIGHT-SCATTERING LAYER SHEET AND LIQUID CRYSTAL DISPLAY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1300 3	\$300	\$1600	12/24/2003

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status is changed, pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above and notify the United States Patent and Trademark Office of the change in status, or

If the SMALL ENTITY i, shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check the box below and enclose the PUBLICATION FEE and 1/2 the ISSUE FEE shown above.

□ Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payme maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.



United States Patent and Trademark Office

UNITED STATES DEPARTMENT OF COMMERCE United States Patent and Trademark Office Address: COMMISSIONER FOR PATENTS P.O. Box 1450 Alexandria, Virginia 22313-1450 www.usplo.gov

DATE MAILED: 09/24/2003

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/979,524 11/23/2001		Hiroshi Takahashi	2224-0193P 6338	
2292	7590 09/24/2003		EXAM	IINER
BIRCH STEWA PO BOX 747	ART KOLASCH & BI	RCH	STEVENSO	N, ANDRE C
FALLS CHURCE	ł, VA 22040-0747		ART UNIT	PAPER NUMBER
			2812	



Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) system (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (703) 305-1383. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.



United States Patent and Trademark Office

UNITED STATES DEPARTMENT OF COMMERCE United States Patent and Trademark Office Address: COMMISSIONER FOR PATENTS P.O. Box 1450 Alexandria, Virginia 22313-1450

APPLICATION NO	. F	ILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/979,524 11/23/2001 2292 7590 09/24/2003		11/23/2001	Hiroshi Takahashi	2224-0193P	6338
			EXAM	INER	
BIRCH STEV PO BOX 747	WART KC	DLASCH & BIRCH		STEVENSO	N, ANDRE C
FALLS CHUR	RCH, VA 22	2040-0747		ART UNIT	PAPER NUMBER
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-4/				DATE MAILED: 09/24/200	3

Notice of Fee Increase on October 1, 2003

If a reply to a "Notice of Allowance and Fee(s) Due" is filed in the Office on or after October 1, 2003, then the amount due will be higher than that set forth in the "Notice of Allowance and Fee(s) Due" since there will be an increase in fees effective on October 1, 2003. See Revision of Patent Fees for Fiscal Year 2004; Final Rule, 68 Fed. Reg. 41532, 41533, 41534 (July 14, 2003).

The current fee schedule is accessible from (http://www.uspto.gov/main/howtofees.htm).

If the fee paid is the amount shown on the "Notice of Allowance and Fee(s) Due" but not the correct amount in view of the fee increase, a "Notice of Pay Balance of Issue Fee" will be mailed to applicant. In order to avoid processing delays associated with mailing of a "Notice of Pay Balance of Issue Fee," if the response to the Notice of Allowance is to be filed on or after October 1, 2003 (or mailed with a certificate of mailing on or after October 1, 2003), the issue fee paid should be the fee that is required at the time the fee is paid. If the issue fee was previously paid, and the response to the "Notice of Allowance and Fee(s) Due" includes a request to apply a previously-paid issue fee to the issue fee now due, then the difference between the issue fee amount at the time the response is filed and the previously-paid issue fee should be paid. See Manual of Patent Examining Procedure, Section 1308.01 (Eighth Edition, August 2001).

Effective October 1, 2003, 37 CFR 1.18 is amended by revising paragraphs (a) through (c) to read as set forth below.

Section 1.18 Patent post allowance (including issue) fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By other than a small entity.....\$1,330.00

(b) Issue fee for issuing a design patent:

By a small entity (Sec. 1.27(a))............\$240.00 By other than a small entity......\$480.00

(c) Issue fee for issuing a plant patent:

By a small entity (Sec. 1.27(a))......\$320.00

By other than a small entity......\$640.00

Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

PE	Application No.	Applicant(s)				
Notice of Allowability	09/979,524	TAKAHASHI ET AL.				
Notice of Allowability	Examiner	Art Unit				
, "	Andre' C. Stevenson	2812				
The MAILING DATE of this communication appeared and the second	(OR REMAINS) CLOSED in this app or other appropriate communication IGHTS. This application is subject to	vill be mailed in due course. THIS				
 This communication is responsive to	der 35 U.S.C. § 119(a)-(d) or (f). be been received. be been received in Application No					
Copies of the certified copies of the priority do International Bureau (PCT Rule 17.2(a)). Contified copies not received:	cuments have been received in this i	national stage application from the				
* Certified copies not received: 5. Acknowledgment is made of a claim for domestic priority u	nder 35 U.S.C. § 119(e) (to a provisi	onal application).				
(a) ☐ The translation of the foreign language provisional a		-,,				
6. Acknowledgment is made of a claim for domestic priority u	nder 35 U.S.C. §§ 120 and/or 121.					
Applicant has THREE MONTHS FROM THE "MAILING DATE" of below. Failure to timely comply will result in ABANDONMENT of 7. A SUBSTITUTE OATH OR DECLARATION must be submitted.	this application. THIS THREE-MON nitted. Note the attached EXAMINER	TH PERIOD IS NOT EXTENDABLE. S'S AMENDMENT or NOTICE OF				
INFORMAL PATENT APPLICATION (PTO-152) which gives reas	son(s) why the oath or declaration is	deticient.				
 8. CORRECTED DRAWINGS must be submitted. (a) including changes required by the Notice of Draftsper 1) hereto or 2) to Paper No (b) including changes required by the proposed drawing (c) including changes required by the attached Examiner 	correction filed, which has b	een approved by the Examiner.				
Identifying indicia such as the application number (see 37 CFR 1 each sheet.	I.84(c)) should be written on the drawi	ngs in the front (not the back) of				
9. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.						
Attachment(s)						
 1⊠ Notice of References Cited (PTO-892) 3□ Notice of Draftperson's Patent Drawing Review (PTO-948) 5⊠ Information Disclosure Statements (PTO-1449), Paper No 7□ Examiner's Comment Regarding Requirement for Deposit of Biological Material 	4☐ Interview Summ 6☐ Examiner's Ame	al Patent Application (PTO-152) Pary (PTO-413), Paper No Pendment/Comment Persons for Allowance				

Application/Control Number: 09/979,524

Art Unit: 2812

Detailed Action

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Claims 19 through 25 have been canceled.

Allowable Subject Matter

Claims 1 through 14 and 16 through 18 are allowed.

Reason for Allowance

Claim #1

Phase separation structure formed by spinodal decomposition from a liquid phase comprising the plurality of polymers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andre C. Stevenson whose telephone number is (703) 308 6227. The examiner can normally be reached on Monday through Friday from 8:00 am to 5:00 pm.

Application/Control Number: 09/979,524

Art Unit: 2812

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached on (703) 308 3325. The fax phone number for the organization where this application or proceeding is assigned is (703) 308 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 1782.

Andre C. Stevenson

Art Unit 2812

09/18/03

July

		Notice of Refere	nees Cites		Application/Control N	Reexamination	oplicant(s)/Patent Under sexamination AKAHASHI ET AL.		
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					Andre' C. Stevenson		2812	Page 1	OI I
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[&]quot;A copy of this reference is not being furnished with this Office action. (See Manual of Patent Examining Procedure, Section 707.05(a).)
"APS encompasses any electronic search i.e. text, image, and Commercial Databases.
U.S. Patent and Trademark Office
PTO-892 (Rev. 03-98)

Notice of References Cited

Sheet 1 of 1 (8/19/02)

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Form PTO	78 TP-10		2224 - 0193P		APPLICATION OP/975				
ン/ IN	FORMATION DISCLOSURE IN AN APPLICATION		Hiroshi TAKASHI et al.						
A OFFICE	(Use several sheets if necess	sary)	November 23, 2	001	GROUP 2871				
EA.		U.S. PATENT I	OCUMENTS		<u>-</u>				
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IN THE U.S. PATENT AND TRADEMARK OFFICE

Hiroshi TAKAHASHI et al. Conf.: 6338 licant:

2812 Group: Appl. No.: 09/979,524

November 23, 2001 Filed: Examiner: L. A. GURLEY

TRANSMITTABLE LIGHT-SCATTERING SHEET AND For: LIQUID CRYSTAL DISPLAY DEVICE

LARGE ENTITY TRANSMITTAL FORM

Assistant Commissioner for Patents Washington, DC 20231

March 5, 2003

Sir:

Transmitted	h	erew	ith	is	a	Rep	ly	to	Restriction/Election
Requirement	in	the	above	e-ide	enti	fied	appl	icat	cion.

	irement in the above-identified application.
	The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.
	Petition for () month(s) extension of time pursuant to 37 C.F.R. §§ 1.17 and 1.136(a). \$0.00 for the extension of time.
\boxtimes	No fee is required.
	A check in the amount of \$0.00 is enclosed.
	Please charge Deposit Account No. 02-2448 in the amount of \$0.00. A triplicate copy of this sheet is attached.

Appl. No. 09/979,524

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

Gerald M. Murphy, Jr., #28,977

GMM/REG:jls 2224-0193P

Falls Church, VA 22040-0747 (703) 205-8000

P.O. Box 747

Attachment(s)

(Rev. 09/19/02)

IN THE U.S. PATENT AND TRADEMARK OFFICE

oplicant: Hiroshi TAKAHASHI et al. Conf.: 6338

Appl. No.: 09/979,524 Group: 2812

Filed: November 23, 2001 Examiner: L. A. Gurley

For: TRANSMITTABLE LIGHT-SCATTERING SHEET

AND LIQUID CRYSTAL DISPLAY DEVICE

REPLY TO RESTRICTION REQUIREMENT

Assistant Commissioner for Patents Washington, DC 20231

March 5, 2003

Sir:

In reply to the Restriction Requirement dated February 3, 2003, the following remarks are respectfully submitted in connection with the above-identified application.

REMARKS

The Examiner has restricted the claims of the invention into the following two groups:

Group I, claims 19-21, drawn to a method of making a semiconductor device;

Group II, claims 1-18 and 22-24, drawn to a semiconductor device.

For the purpose of examination of the present application, Applicants elect, with traverse, Group II, claims 1-18 and 22-24.

Rejoinder of the groups of the invention is proper because the light-scattering sheet of claim 1 of Group II and the process for producing a light-scattering sheet of claim 19 of Group I are so intimately related that no undue burden is placed upon the Examiner. That is, independent claim 19 contains all the limitations of independent claim 1 and a finding of allowability of independent claim 1 (of Group II) would also result in independent claim 19 (of Group I) to be instantly allowable.

Accordingly, examination of all of the claims of the invention on the merits is respectfully requested. In the event that the Examiner chooses to not immediately rejoin the claims, Applicants submit that once allowable subject matter is found for the product claims, and providing the method of making claims include the same allowable subject matter, the Examiner should rejoin the claims.

MPEP §821.04.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By Gerald M. Murphy, Jr., #28,977

GMM/REG:jls 2224-0193P P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

(Rev. 01/02/02)

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant: Hiroshi TAKAHASHI et al. Conf.:

6338

Appl. No.:

09/979,524

Group:

2812

Filed:

November 23, 2001 Examiner: A. Stevenson

For:

TRANSMITTABLE LIGHT-SCATTERING SHEET AND LIQUID

CRYSTAL DISPLAY DEVICE

LARGE ENTITY TRANSMITTAL FORM

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450 August 8, 2003

Sir:

Transmitted herewith is an amendment in the above-identified application.

The enclosed document is	is being	transmitted	via	the	Certificate
of Mailing provisions	of 37 C.	F.R. § 1.8.			

The enclosed document is being transmitted via facsimile.

The fee has been calculated as shown below:

	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA	RATE	ADDITIONAL FEE
TOTAL	24	_	24	=	0	\$ 18	\$0.00
INDEPENDENT	2	_	3	=	0	\$ 84	\$0.00
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			-			TOTAL	\$0.00

Appl. No. 09/979,524

(Rev. 04/30/03)

		onth(s) extension of time pursuant to
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	Check(s) in the amount of	of \$0.00 is(are) enclosed.
	Please charge Deposit A \$0.00. This form is subr	account No. 02-2448 in the amount of mitted in triplicate.
overprequ:	urrent, and future repli payment to Deposit Accour	essioner is hereby authorized in this, es, to charge payment or credit any at No. 02-2448 for any additional fees 1.16 or under 37 C.F.R. § 1.17; ime fees.
		Respectfully submitted,
		BIRCH, STEWART, KOLASCH & BIRCH, LLP
	(4)	Derald M. Murphy Jr., #28,977 P.O. Box 747
•	REG/jeb -0193P	Falls Church, VA 22040-0747 (703) 205-8000
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IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant:

Hiroshi TAKAHASHI et al. Conf.:

6338

Appl. No.:

09/979,524

Group:

2812

Filed:

November 23, 2001

Examiner: A. Stevenson

For:

TRANSMITTABLE LIGHT-SCATTERING SHEET AND LIQUID

CRYSTAL DISPLAY DEVICE

REPLY UNDER 37 C.F.R. § 1.111

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

August 8, 2003

Sir:

In reply to the Office Action dated May 8, 2003, the following amendments and remarks are respectfully submitted in connection with the above-identified application.

This reply includes the following:

- (1) Amendments to the Specification;
- (2) Amendments to the Claims; and
- (3) Remarks.

IN THE SPECIFICATION:

Please amend the paragraph bridging pages 58 and 59 with the following paragraph:

--Cellulose acetate propionate (3 parts by weight) (acetylation degree: 2.5%, propylation degree: 45%, number-average molecular weight in terms of polystyrene: 75000, manufactured by Eastman, Ltd., CAP-482-20) and 3 parts by weight of copolyester (fluorenemodified polyester, OPET; manufactured by Kanebo Co., Ltd., OP7-40) in 84 parts 94 parts by weight of THF. were dissolved solution was cast on a triacetylcellulose film with the use of wire bar #20, and the cast film was allowed to stand in an oven at a temperature of 60 °C for 2 minutes, and then THF was evaporated to form a coating layer having thickness of about 2 µm. . When the sheet of the coating layer was observed with a transmission optical microscope, the sheet had a droplet phase structure same as Example 4, in which two kinds of dispersion phases different in size were dispersed regularly with an average interphase distance. Moreover, the total light transmittance of the sheet was 93%. --

IN THE ABSTRACT:

Please amend the Abstract as Follows:

ABSTRACT

The reflective liquid crystal display device comprises a polarizing plate 1 disposed forwardly of the a liquid crystal cell 6, a reflecting means 5 relector which is disposed on backside of the liquid crystal cell and reflects an incident light, and a light-scattering sheet 2 which is disposed forwardly of reflecting means the reflector and scatters the incident light isotopically. The light-scattering sheet can be prepared with the use of a spinodal decomposition method comprising by of coating a mixture liquid containing a plurality of polymers varying in refractive index on a transparent support and evaporating or removing a solvent to form a light-scattering layer having a droplet phase structure. The light-scattering layer includes a light-scattering layer showing a maximum intensity of the scattered-light at scattering angle angles of 3 to 40°, and a light-scattering layer showing maximums intensity of the scattered-light respectively at smaller angle angles of 2 to 20° and larger angle θ b.

AMENDMENTS TO THE CLAIMS

- 1. (Currently Amended) A transmittable light-scattering sheet which comprises a light-scattering layer composed of a plurality of polymers varying in refractive index and having at least a droplet phase structure, wherein the layer has a phase separation structure formed by spinodal decomposition from a liquid phase comprising the plurality of polymers.
- 2. (Currently Amended) $\bf A$ The transmittable light-scattering sheet according to Claim 1, wherein an incident light is diffused isotropically, and a maximum value of scattered light intensity appears at a scattering angle of 3 to 40° .
- 3. (Currently Amended) A The transmittable light-scattering sheet according to Claim 1, wherein an average diameter of droplets in the droplet phase structure is 0.1 to 20 μm .
- 4. (Currently Amended) A The transmittable light-scattering sheet according to Claim 1, wherein an average distance between droplet centers is 0.5 to 15 μ m and a standard deviation of the average distance is 40 % or less of the average distance in the droplet phase structure.

- 5. (Currently Amended) A The transmittable light-scattering sheet according to Claim 1, wherein the proportion of droplets in the droplet phase structure is 30 to 70 volume % based on the whole light-scattering layer.
- 6. (Currently Amended) A The transmittable light-scattering sheet according to Claim 1 which comprises a light-scattering layer scattering an incident light isotropically, wherein the light-scattering layer expresses maximum values of a scattered light intensity at two scattering angles.
- 7. (Currently Amended) A The transmittable light-scattering sheet according to Claim 6, wherein a smaller angle θ a of the maximum value is 2 to 20° in the scattered light intensity.
- 8. (Currently Amended) **A** The transmittable light-scattering sheet according to Claim 6, the ratio of a smaller angle θ a to a larger angle θ b of maximum values is θ b/ θ a = 1.5 to 10.
- 9. (Currently Amended) A The transmittable light-scattering sheet according to Claim 6, wherein the light-scattering layer has

at least a droplet or an island-in an ocean phase structure, and a distribution of particle size of dispersed phase in the phase structure has two peaks at different average particle sizes.

- 10. (Currently Amended) A The transmittable light-scattering sheet according to Claim 1, wherein a total light transmittance is 70 to 100 %.
- 11. (Currently Amended) A The transmittable light-scattering sheet according to Claim 1, wherein a difference between refractive indexes of a the plurality of polymers is 0.01 to 0.2.
- 12. (Currently Amended) A The transmittable light-scattering sheet according to Claim 1, wherein a the plurality of polymers comprises a first polymer and a second polymer selected from a styrenic resin, a (meth)acrylic resin, a vinyl ester-series resins, a vinyl ether-series resin, a halogen-containing resin, an alicyclic olefinic resin, a polycarbonate-series resin, a polyester-series resin, a polyamide-series resin, a silicone-series resin, a cellulose derivative and a rubber or an elastomer, and the ratio of the first polymer to the second polymer is the former/the latter = 10/90 to 90/10 (weight ratio).

- 13. (Currently Amended) A <u>The</u> transmittable light-scattering sheet according to Claim 1, wherein at least one polymer comprises a cellulose ester.
- 14. (Currently Amended) A The transmittable light-scattering sheet according to Claim 1, wherein at least one polymer comprises a cellulose acetate.

15. (Cancelled)

- 16. (Currently Amended) A The transmittable light-scattering sheet according to Claim 1, which comprises a transparent support and the light-scattering layer laminated on at least one side of the transparent support.
- 17. (Currently Amended) A The transmittable light-scattering sheet according to Claim 16, wherein the transparent support is optically isotropic.
- 18. (Currently Amended) A The transmittable light-scattering sheet according to Claim 16, wherein the transparent support comprises cellulose acetate film.

- 19. (Withdrawn) A process for producing a light-scattering sheet, which comprises removing or evaporating a solvent from a liquid mixture composed of a plurality of polymers varying in refractive index to form a light-scattering layer having at least a droplet phase structure due to spinodal decomposition.
- 20. (Withdrawn) A The process according to Claim 19, which comprises applying the liquid mixture on a transparent support and removing a solvent in the liquid mixture to form a phase separation structure.
- 21. (Withdrawn) A The process according to Claim 19, which comprises applying a solution, in which a plurality of polymers varying in refractive index is dissolved homogenously, on a cellulose acetate film coated with a coating layer having solvent-resistance, and removing a solvent in the solution to form a droplet phase structure due to spinodal decomposition.
- 22. (Currently Amended) A reflective liquid crystal display unit which comprises a liquid crystal cell having a liquid crystal sealed therein, a reflecting means for reflecting an incident light disposed behind the liquid crystal cell, and a the light-scattering

Appl. No. 09/979,524

sheet recited in Claim 1 disposed forwardly of the reflecting means.

- 23. (Currently Amended) A The reflective liquid crystal display unit according to Claim 22, wherein a polarizing plate is disposed forwardly of the liquid crystal cell, and a the light-scattering sheet recited in Claim 1 is disposed between the liquid crystal cell and the polarizing plate.
- 24. (Currently Amended) A The reflective liquid crystal display unit according to Claim 22, which comprises a liquid crystal cell having a liquid crystal sealed therein, a reflecting means for reflecting an incident light disposed on one side of the liquid crystal cell, a polarizing means for polarizing an reflective light is disposed on the other side of the liquid crystal cell, and a the light-scattering sheet recited in Claim 1 disposed between the liquid crystal cell and the polarizing means.
- 25. (New) The transmittable light-scattering sheet according to Claim 1, wherein the plurality of polymers vary in refractive index.

REMARKS

Applicants thank the Examiner for the thorough examination of the application. No new matter is believed to be added to the application by this amendment.

Amendments to the Specification

The amendments to the specification correct a minor error and find support at page 58, line 6 of the originally filed specification. The amendments to the abstract correct minor errors.

Status of the Claims

Claims 1-14 and 16-25 are pending in the application. Applicants elected claims 1-18 and 22-24 with traverse in the paper filed March 5, 2003. Claims 1-18 stand rejected.

Claim 15 is cancelled by this amendment. The amendments to claim 1 incorporate subject matter from cancelled claim 15. Claim 25 sets forth subject matter from cancelled claim 15. The amendments to claims 2-14 and 16-18 and 20-24 improve the language of these claims without reducing their scope.

Rejection Under 35 U.S.C. §103(a) Over Yamazaki In View Of Nakao

Claims 1-18 are rejected under 35 U.S.C. §103(a) as being obvious over Yamazaki (U.S. Patent 6,266,113 B1) in View Of Nakao (U.S. Patent 6,452,650 B1). Applicants traverse.

The Present Invention And Its Advantages

The present invention pertains to a novel transmittable light scattering sheet. Claim 1 sets forth: "A transmittable light-scattering sheet which comprises a light-scattering layer composed of a plurality of polymers varying in refractive index and having at least a droplet phase structure, wherein the layer has a phase separation structure formed by spinodal decomposition from a liquid phase comprising the plurality of polymers."

The advantages of the inventive technology include strong reflected light intensities at specific light scattering angles. The invention yields high directionalities and brightness of the display surface over a wide angle range. See Tables 1 and 2 at pages 56 and 63 of the specification.

Also, the spinodal decomposition results in unique properties. This is discussed in the paragraph starting at page 29, line 20 of the specification, which states:

Further, since the light-scattering layer (2) is formed by spinodal decomposition via evaporation of solvent from liquid phase comprising a plurality of polymers (liquid phase such as mixed solution or liquid mixture, and solution in ordinary temperature), it is considered that, in the process of evaporating solvent, the phase separation structure, in which average distance between domains has two kinds of regularities owing to the difference in compatibility of the constituting polymer component with substrate material, is formed. When such transmittable light-scattering sheets are used, the incident light is substantially isotropically scattered and high directionality and diffusibility together can be imparted to the transmitted scattered light.

Therefore, the invention produces unique light scattering properties that represent a fundamental improvement over the conventional art.

Distinctions Of The Invention Over Yamazaki and Nakao

Yamazaki pertains to a reflection type liquid crystal display device. The technology of Yamazaki is typified by claim 1, which states:

1. In a reflection type liquid crystal display device comprising a light modulation layer disposed between a pair of electrodes, at least one of which is transparent electrode, the light modulation layer being controlled to take on one of a light scattering state and light transmitting state in accordance with a voltage applied between the electrodes; at least one color separation layer mounted at the back of the light modulation layer; and a reflection layer mounted at the back of the color separation layer; wherein the color separation layer comprises one of a cholesteric liquid crystal polymer for reflecting light within a predetermined wavelength range and a dielectric multi-layered thin film for transmitting a light within a predetermined wavelength range and reflecting light outside the predetermined wavelength range.

The operation of this type of display is discussed by Yamazaki at column 3, lines 26-36, which states:

In the case of the reflection type liquid crystal display device having the structure in which the droplet type polymer dispersed type liquid crystal layer is used as the light modulation layer and in which the interference filter and the mirror layer as the reflection layer are arranged at the back, with no application of voltage (i.e., in the transparent state), the liquid crystal molecules can be arrayed not in the field direction but at cause an inconsistency between angle to longitudinal refractive index of the liquid crystal molecules and the refractive index of the polymer thereby to leave a slight dispersion. As a result, the regularly reflected light is diffused with a width to raise a problem in that the invisible range is widened, and the diffused color is mixed with the color having passed through the color separation layer to raise the problem that the color purity drops.

Yamazaki modulates light as discussed at column 43, lines 32-38, which states:

The light modulation layer comes, when the voltage is not applied, into a scattered state like the paper white, and, when applied, into a highly transparent state so that an arbitrary color such as the red, blue or green color can be reconstructed as a highly pure color to provide an excellent contrast by the combined action of the color separation layer and the reflection layer.

Yamazaki fails to disclose a composition of a plurality of polymers varying in refractive index and having at least a droplet phase structure. The Examiner admits to the failings of Yamazaki at page 2, lines 17-19 of the Office Action. The Examiner then tries to apply the teaching of Nakao to address the failings of Yamazaki.

The technology of Nakao is typified by claim 1 of the patent, which states:

1. A polymer dispersion type liquid crystal display element comprising:

a pair of substrates, one of the substrates being an active matrix substrate having thin film transistors formed thereon;

an electrode formed on an opposite surface of each of the substrates;

polymers;

liquid crystal droplets being deformed into a compressed structure compressed in a cell gap direction; and

a polymer-liquid crystal complex held between the pair of substrates, the polymer-liquid crystal complex comprising the polymers and the liquid crystal droplets dispersed in the polymers;

wherein:

an amount of deformation of the liquid crystal droplets is set to be in range in which a phenomenon of liquid crystal molecules rising up in the cell gap direction is not caused by excluded volume effects of the liquid crystals;

when an anchoring strength is represented by a driving voltage V_{90} , where V_{90} is a driving voltage at a transmittance of 90%, the anchoring strength being an index showing the interaction of the polymers and liquid crystal at the phase boundary between the liquid crystal and the polymers, the anchoring strength is such that the driving voltage V_{90} is in the range of about 7.5 V to about 12.5 V; and

a deformation rate of the liquid crystal droplets is 20% or lower.

Nakao describes "a plurality of polymer liquid crystal complex layers are laminated, so that the liquid crystals in each layer can be aligned in parallel with the substrates and also the

orientations of the liquid crystals aligned in a plane parallel with the substrates can be made different for each of the layers." See Nakao at column 48, lines 41-45. With regard to the average diameter of the liquid crystal droplet, Nakao states "The smaller the particle diameter of the liquid crystals droplets becomes, the further the scattering of light increases in intensity, so it is desirable for application to the scattering type liquid crystal display element that the liquid crystal droplets have a size of 2 μm or less." See Nakao at column 19, lines 44-49. Nakao discusses the distance between liquid crystal droplets at column 36, lines 1-5, stating "when the polymer dispersion type liquid crystal display element thus produced was measured with a microscope on an average mesh size (gaps between liquid crystal droplets of an average mesh size aligned in parallel with the plane of the substrates), the average mesh gap was 1.2 μ m." Nakao at column 36, lines 6-10 discusses alignment, stating "the liquid crystal molecules allowed to be fully aligned in parallel to the electric field by applying 10V, 30Hz of rectangular waves to the transference electrodes 13, 14 of the polymer dispersion type liquid crystal element." Nakao at column 48, lines 62-63 states: "A layered product 127 is held via the transparent glass substrates."

Finally, Nakao at column 5, lines 22-25 purports to produce a "polymer dispersion type liquid crystal display element capable of

providing improved scattering characteristics without any deterioration of display characteristics . . ."

Both Yamazaki and Nakao fail to disclose or suggest spinodal decomposition from the liquid phase comprising a plurality of polymers for forming the phase separation structure.

That is, the droplet phase of both Yamazaki and Nakao are polymer-liquid crystal complex forming a of obtained by photopolymerizable monomers and liquid crystalline materials to photopolymerize only the monomers. Yamazaki and Nakao both fail to disclose spinodal decomposition from the liquid phase. The present invention's mechanism for forming the droplet phase is therefore fundamentally different from that of Yamazaki or Nakao. result, a person having ordinary skill in the art would not be motivated by the teachings of Yamazaki and Nakao to produce a claimed embodiment of the invention. Thus a prima facie case of obviousness has not been made over Yamazaki and Nakao.

Further, even if one assumes arguendo that Yamazaki and Nakao can be combined to allege prima facie obviousness, this obviousness would be rebutted by unexpected results.

The droplet phase structure of Yamazaki and Nakao are formed by photopolymerizing monomers, and the liquid crystalline materials are dispersed randomly in a photopolymerized polymer. Since the interphase distance of the liquid crystals (a dispersed phase) cannot be precisely controlled, a phase separation structure having regularities in the average distance between domains could not form.

The structures of Yamazaki and Nakao therefore correspond to Comparative Examples 1-3 set forth at pages 53, 59 and 60 of the specification. Similar to Yamazaki and Nakao, the sheets of Comparative Examples 1-3 have random droplet phase structures. Tables 1 and 2 at pages 56 and 63 of the specification show that Yamazaki and Nakao cannot realize a strong reflected light intensity at the specific light scattering angles, high directionalities and brightness of the display surface over the wide angle range.

Further, In Nakao and Yamazaki the liquid crystalline materials are aligned in a predetermined direction by applying a voltage. The process of orientation is therefore complicated and requires equipment for applying voltage.

On the other hand, the invention forms a sheet by spinodal decomposition from the liquid phase to form a phase structure having regularities in average distance between domains. The inventive sheet can exhibit both an isotropic incident light scattering characteristic and a high directionality or diffusibility to transmitted scattered light. This is discussed in the paragraph starting at page 29, line 20 of the specification.

Further, Tables 1 and 2 at pages 56 and 63 of the specification show a strong reflected light intensity at specific light scattering angles, high directionalities, and bright ness of the display surface over a wide angle range. Thus the advantages are clear.

As has been shown, Yamazaki and Nakao fail to render the present invention prima facie obvious. Further, unexpected results would fully rebut any obviousness that could be alleged. Accordingly, this rejection is overcome and withdrawal thereof is respectfully requested.

Information Disclosure Statements

Applicants thank the Examiner for considering the Information Disclosure Statement filed November 23, 2001 and for making the initialed PTO-1449 form of record in the application in the Office Action mailed may 8, 2003. The Examiner is respectfully requested to consider the Information Disclosure Statement filed August 19, 2002.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at

Appl. No. 09/979,524

the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

P.O. Box 747

Falls Church, VA 22040-0747

(703) 205-8000

GMM/REG/jeb 2224-0193P-

Attachment(s):



IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant: TAKAHASHI et al.

Conf.:

6338

Appl. No.:

09/979,524

Group:

2812

Filed:

November 23, 2001 Examiner: STEVENSON, A.C.

For:

TRANSMISSION LIGHT-SCATTERING LAYER SHEET AND LIQUID CRYSTAL DISPLAY

LARGE ENTITY TRANSMITTAL FORM

December 3, 2003

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

Transmitted herewith please find remarks in the above-identified application.

The	enclose	d document	is	being	g trans	smi	.tted	via	the	Certifica	te
of	Mailing	provisions	of	37 0	C.F.R.	§	1.8.				

П The enclosed document is being transmitted via facsimile.

The fee has been calculated as shown below:

	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA	RATE	ADDITIONAL FEE
TOTAL	24	- 24		=	0	\$ 18	\$0.00
INDEPENDENT	2	- 3		=	0	\$ 86	\$0.00
FIRST PRESENTATION OF A MULTIPLE DEPENDENT CLAIM							\$0.00
						TOTAL	\$0.00

Appl. No. 09/979,524

(Rev. 11/26/03)

	No fee is required.
	A check in the amount of \$0.00 is enclosed.
	Please charge Deposit Account No. 02-2448 in the amount of \$0.00. This form is submitted in triplicate.
overn requ:	If necessary, the Commissioner is hereby authorized in this arrent, and future replies, to charge payment or credit any payment to Deposit Account No. 02-2448 for any additional feetired under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17 icularly, extension of time fees.
	Respectfully submitted,
	BIRCH, STEWART, KOLASCH & BIRCH, LLE
•	B. M. Murphy, Jr. #28,977 P.O. Box 747 Falls Church, VA 22040-0747
2224	-0193P (703) 205-8000
Attac	chment(s)



MS ISSUE FEE

REPLY UNDER 37 C.F.R. § 1.116 EXPEDITED PROCEDURE EXAMINING GROUP 2812

PATENT 2224-0193P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant:

TAKAHASHI et al.

Conf.:

6338

Appl. No.:

09/979,524

Group:

2812

Filed:

November 23, 2001

Examiner: STEVENSON, A. C.

For:

TRANSMISSION LIGHT-SCATTERING LAYER SHEET AND LIQUID CRYSTAL DISPLAY

COMMENTS ON EXAMINERS REASONS FOR ALLOWANCE

MS AF

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

December 3, 2003

Sir:

In connection to the Notice of Allowability dated September 24, 2003, the following remarks are respectfully submitted in connection with the above-identified application.

REMARKS

Telephonic Interview with the Examiner

The Applicants thank the Examiner for graciously conducting a telephonic interview with the Applicants' representative on November 20, 2003. During the telephonic interview, the anomalies in the enumeration of allowed claims were discussed. It was agreed that this paper would be filed as a result of the interview.

Status of the Claims

In the Notice of Allowability, the Examiner stated that the allowed claims are 1-14 and 16-18. In the detailed action at page 2 of the Notice of Allowability, the Examiner states: "Claims 19-25 have been cancelled." Upon discussing allowable subject matter, the Examiner states: "Claims 1-14 and 16-18 are allowed."

Applicants respectfully note that the application as originally filed on November 23, 2001, presented claims 1-24 for the Examiner's consideration. On February 3, 2003, the Examiner issued an Office Action containing an election/restriction requirement that divided the claims into the following two groups:

- I. Claims 19-21 drawn to a method of making a semiconductor device, and
- II. Claims 1-18 and 22-24 drawn to a semiconductor device.

Also, Applicants note that claims 22-24 depend upon claim 1 and these claims are instantly allowable if claim 1 is found to be allowable.

Claim 25, which was presented on August 8, 2003, also depends upon claim 1 and therefore becomes instantly allowable if claim 1 is found to be allowable.

In the Reply of March 5, 2003, the Applicants elected group II (Claims 1-18 and 22-24) for examination on the merits.

Accordingly, the allowed claims should be 1-14, 16-18 and 22-25. Also, claim 15 has been cancelled and its subject matter has been incorporated into claim 1 in the Reply of August 8, 2003.

Therefore, Applicants respectfully request that the Examiner issue a Supplemental Notice Of Allowability indicating allowed claims in accordance with group II.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Appl. No. 09/979,524

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

G∉rald

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,/ #28,9//

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(Rev. 09/30/03)